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**DOCUMENTATION POLICIES AND PROCEDURES
OF THE
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**

BY

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FACILITY FORM 802	N 67-81296	
	(ACCESSION NUMBER)	(THRU)
	10 / 13 11	<i>None</i>
	(PAGES)	(CODE)
(NASA CR OR TMX OR AD NUMBER)		(CATEGORY)

**Presented before the
Documentation Committee
Advisory Group for Aeronautical Research and Development,
North Atlantic Treaty Organization**

**Istanbul, Turkey
October 4, 1960**

**NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON**

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By Bertram A. Mulcahy*

INTRODUCTION

NASA's documentation program, like those of the organizations which you represent, is a service program that must be responsive to the needs of the organization that it serves. Our present documentation program is an extension of that of NACA, with which many of you are familiar. The elements that comprised NACA, including those of NACA's documentation program, have been totally absorbed into NASA. Until the last few months, no basic changes had been made in the documentation program, which had been expanded somewhat in size but not in functions. A functional expansion of the documentation program is now underway, and I will outline this expansion for you.

In order to provide a frame of reference for the environment in which NASA's documentation program will operate, the present structure and the over-all missions of NASA are briefly reviewed. This review is followed by an outline of the present documentation program, a sketch of the expanded program that is planned, and an estimate of the relevance of our proposed program to your documentation programs.

NASA STRUCTURE AND MISSIONS

The structure and missions of NASA are discussed with reference to the NASA organization chart (attachment A). In addition to the staff functions represented, the chart shows four program offices and two support offices. These will be discussed in turn.

Office of Life Science Programs

This Office is concerned with the problems that arise with the entry of men into the environment that lies beyond the earth's atmosphere, and their return to the earthly environment. The problems include the

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NASA Office of Technical Information and Educational Programs

determination of human reactions to acceleration, weightlessness, confinement, isolation, cosmic radiations, non-terrestrial atmospheres, variations in diurnal period, closed-system ecology, and many other factors. The Office is also organizing investigations to determine the life forms that may exist on other planets. To date, the Office of Life Sciences Programs does not have any facilities under its direct jurisdiction, but a Life Sciences Research Center is planned.

Office of Launch Vehicle Programs

This Office is responsible for developing and launching the vehicles that are used to place a space vehicle into orbit or to probe outer space. Lack of high-thrust vehicles has seriously hampered U. S. space programs to date, and the development of such vehicles is the first order of business for this Office. It is their intention to develop a fleet of standard vehicles, of various sizes, that will meet future propulsion requirements with a minimum number of different designs and configurations. This standardization, and repeated launchings of standardized units, will provide for each flight mission an available vehicle of proven reliability and suitable propulsion capacity. The members of this launch vehicle fleet are tabulated below.

Vehicle	Orbital capacity, pounds, 300-mile orbit
Scout	150
Thor-Delta	480
Thor-Agena B	1, 600
Atlas-Agena B	5, 800
Centaur	8, 500
Saturn, C-1	19, 000

Later configurations of the Saturn will have an orbital capacity about 2 1/2 times that of the Saturn C-1.

Development of launch vehicles is concentrated at the George C. Marshall Space Flight Center, Huntsville, Alabama, which was transferred to NASA July 1, 1960. Approximately 5300 persons are now employed at Marshall, including those assigned to launch operations at Cape Canaveral, Florida.

Office of Space Flight Programs

This Office provides the spacecraft needed to perform the various space flight missions of NASA, which may be grouped into three categories:

space sciences, applications, and manned flight. In space-science missions, instrumented satellites and probes are sent forth to gain new knowledge on the physical characteristics of the upper atmosphere, space, and the moon and planets. Applications include the meteorological satellite, Tiros I, which will be followed by more complex meteorological satellites, and the passive communications satellite Echo, which will be followed by additional passive satellites and by active (repeater) communication satellites. The first phase of the manned-flight program is Project Mercury, which will include sending the first American into space. The first orbital flight, which will comprise three trips around the earth, will probably be made in 1961.

The NASA execution of space flight programs is carried out by the Goddard Space Flight Center at Greenbelt, Maryland, and, under contract with the California Institute of Technology, by the Jet Propulsion Laboratory at Pasadena, California. Goddard, which presently employs about 1500 persons, is responsible for earth orbiting spacecraft, and JPL, with 2400 employees, is concerned with the exploration of deep space, including unmanned lunar and interplanetary flights.

It should be noted that both the launch-vehicle programs and the space-flight programs are heavily supported by contract operations in addition to the activities underway within the space flight centers and JPL.

As an indication of the rate at which NASA is conducting space research, the following condensation of anticipated launches is presented:

<u>Mission Type</u>	<u>1960 (Fourth quarter)</u>	<u>1961</u>	<u>1962</u>
Scientific Satellites	2	9	5
Lunar and Deep Space Probes	2	-	3
Meteorology	1	1	2
Communications	-	1	-
Mercury	4	13	4
Vehicle Test	1	7	9
	<u>10</u>	<u>31</u>	<u>23</u>

Office of Advanced Research Projects

This Office directs the activities of the four Research Centers, which comprised the operations elements of the former NACA. The Research Centers are engaged in basic research, with emphasis placed on the extension of the basic sciences to current aeronautical and astronautical problems, in order to provide a sound scientific background and basis for NASA's development programs.

Langley Research Center, with a staff of 3200 at Langley Field, Virginia, is occupied with such basic problems as the physical limitations of materials and structures, the physics and aerodynamics of re-entry vehicles, continuing work in aircraft aerodynamics, and fundamental research in stability and control.

Lewis Research Center, at Cleveland, Ohio, has a staff of 2700 that is concerned with investigations relating to all aspects of aircraft and rocket propulsion. Research programs are now in progress on new and advanced high-energy propellants for chemical rockets, on nuclear rockets, and on electrical propulsion devices.

Flight Research Center, at Edwards, California, employs some 400 persons. Most of them are currently engaged in flight research on the X-15 airplane. Although this project comes under the general heading of aviation, it is a significant step in the program of placing a man into space. The airplane is designed for a maximum speed above Mach 6, and a maximum altitude of 250,000 feet.

Ames Research Center, Moffett Field, California, has a staff of some 1400 persons. They conduct research on the environmental physics of space operations, including simulation techniques, on gas dynamics at extreme speeds, and on automatic stabilization, guidance, and control of space vehicles. In aeronautics, they are presently engaged in high-speed aerodynamics and applications of vertical take-off and landing techniques.

Office of Business Administration

This Office supervises the NASA business functions such as personnel, procurement, supply, fiscal management, and security. It operates in a decentralized fashion, with the staff at each Center providing these services for the Center under policy guidance from this Office.

Office of Technical Information and Educational Programs

On June 1, 1960, the Administrator of NASA established the NASA Office of Technical Information and Educational Programs. Mr. Shelby Thompson is Director, and Mr. Melvin S. Day is Deputy Director. This Office is on an organizational level with the major NASA program offices, and reports, as they do, to the Associate Administrator. One of the objectives in establishing the Office at this level was to invest it with sufficient stature and autonomy that it might carry out a comprehensive program in its assigned area of responsibility. The Technical Information Division, which is now being expanded modestly in personnel but substantially in functions, is one of the two divisions under the new office. A newly established Educational Programs Division is the other.

EDUCATIONAL PROGRAMS

The Educational Programs Division, which is not yet fully staffed, has three major objectives:

- (1) To disseminate to the general and technical publics, both national and international, comprehensive information about NASA programs. This dissemination will employ exhibits, films, publications, and lectures, and will be made through the mediums of press, radio, television, educational organizations, and direct correspondence.
- (2) To stimulate, at all scholastic levels, interest in aeronautics and space science, and to muster the NASA information resources that will provide material for educational programs.
- (3) To encourage private enterprise to carry out public-service educational programs that will diffuse information on space activities, their results, and their significance.

As an example of the divisions activities, one of the television networks is currently preparing a 26-week series of half-hour programs presenting NASA activities. The series will be broadcast nationally in the U. S. beginning in the fall of 1961. In addition to the series, there will be several one-hour programs of which the first will be broadcast next spring.

Several documentary films are in preparation by NASA, and some have already been completed. The film on project Echo has been broadcast by BBC, and has been shown extensively, abroad, by the U. S. Information Agency. A film on Project Mercury will be released in about a month.

PRESENT NASA DOCUMENTATION ACTIVITIES

NASA in its first two years has been carrying out a technical-information program which is an extension of that of NACA, with which many of you are familiar. The program divides quite neatly into two parts: library activities and report distribution activities. These activities are presented here with only such detail as appears necessary to an explanation of the way in which they are to be expanded, and of how the proposed expansion will affect organizations outside NASA.

Library Activities

The NASA library system, which comprises seven libraries at geographically separated locations, operates within a work program of which some elements are performed centrally to serve the entire system, and some elements are performed separately by the individual libraries.

Much of the technical information that NASA needs in support of its programs is available only in the reports of various organizations. Few of these reports are widely announced, and the aggregate job of perceiving and acquiring technical reports is a tremendous task for the many organizations that need them. Each organization that needs such reports must acquire them through its own surveillance system, its own network of exchange agreements, and a continuing program of individual requests based on bibliographies, lists of references that are cited in related reports, announcements of meetings, and requests from the staff that the library serves.

The amount of work required to collect technical reports invests in each of them an extrinsic value in addition to the value inherent in the substance of the report. In order that the cost of NASA's acquisition program may be minimized, and to realize maximum utility from the reports collected, NASA centralizes the processing of reports acquired from other organizations for NASA use. NASA's Langley library provides cataloging services for the whole library system, abstracting and indexing each newly acquired report and providing a set of printed catalog cards to each of the seven libraries. Each library thus has a union catalog of all NASA report holdings, which is one of the basic tools for NASA bibliographic searches. Each report that is cataloged is considered a part of the common holdings of the over-all NASA library system, and is available to each of the member libraries through interlibrary loan. Langley also prepares a bi-weekly title announcement list, which groups recently acquired reports under broad subject headings, but which contains no abstracts or indexes. Each NASA library disperses copies of the announcement list to the technical staff that it serves. To date, the list has not been made available outside of NASA.

Materials that are commercially available (such as journals, periodicals, and books) are procured and processed by each of the NASA libraries in accordance with the requirements of the staff that it serves. There has been no comprehensive NASA program to index the information contained in these documents. As a consequence, NASA has relied principally on indexes and abstract journals prepared by other organizations as a means of retrieving the information contained in such documents.

Distribution Activities

NASA's distribution activities are designed to provide widespread announcement and dissemination of reports written by, or for, NASA.

Each of you, as a member of the AGARD Documentation Committee, is on the mailing list to receive NASA Technical Publications Announcements. This bi-weekly document presents an abstract of each item newly added to

four groups:

- (1) NASA technical publications.
- (2) Contractor reports to NASA that are judged suitable for general distribution.
- (3) Journal articles, symposium presentations, speeches, etc. prepared by NASA staff members or NASA contractors.
- (4) Reports, including those of AGARD, for which NASA is distributing agent in the United States.

NASA Technical Publications Announcements is mailed each two weeks to some 3500 organizations and individuals, who scan it to identify the NASA publications that appear relevant to their work. The publications thus identified are then requested from the local depository that serves the individual. NASA also issues an annual index to NASA reports issued or declassified during the year. The reports, arranged according to a hierarchial classification system, are listed by title and author, without abstracts. A given report may be listed under several headings, depending on the subject range that it covers, and an author index to entries is included.

In addition to the announcement of new documents, NASA maintains lists by which each new NASA document is mailed automatically to those who have established a requirement for documents of that category. At present, NASA is providing its documents to depository organizations in all but one of the NATO countries. That country has been offered the documents, but arrangements for the deposit have not yet been completed.

Unclassified documents produced by NASA are also available for purchase by any individual in the free world. NASA TECHNICAL NOTES and TECHNICAL TRANSLATIONS may be purchased from the Office of Technical Services, U. S. Department of Commerce, and NASA TECHNICAL REPORTS from the Superintendent of Documents, U. S. Government Printing Office.

Most of NASA's existing document exchanges with organizations in countries other than the United States have been arranged through the governments of those countries. We will continue to operate through the various foreign offices, but we also welcome direct negotiations for a direct exchange with any organization substantially engaged in aeronautical and space activities.

PROJECTED NASA DOCUMENTATION ACTIVITIES

NASA's staff now totals more than 15,000 persons, and includes some 2700 research professionals. In order to meet the staff's needs for current technical information, we intend to acquire a space-science document collection that will be the world's foremost. Items to be added to the collection will be tested against criteria of relevance developed by the technical staff, in order to keep the collection within manageable bounds. However, because NASA's interests encompass all peaceful exploitation of space, the collection will be valuable to scientists outside NASA as well as to those within NASA. We therefore intend to make information in the collection available outside NASA in a number of ways. These include publication of an abstract journal, access to the collection, and publication of specialized bibliographies.

The Abstract Journal

One of the major NASA documentation endeavors is to be the establishment of an abstract journal that will:

- (1) Cover all space-related fields of science.
- (2) Provide world-wide coverage.
- (3) Make announcements promptly.
- (4) Be liberally indexed to make it a useful permanent retrieval tool.

The design of the journal will be based primarily on the requirements of NASA's technical staff, and it is intended that the journal will provide each technical staff member with a complete, current bibliographic research tool at his elbow. Since a specially prepared current bibliography tailored to each individual's requirements is manifestly impossible, the journal will be a composite response to the integrated requirements of the staff.

The coverage of the abstract journal will be controlled by three factors: the limits set upon the subject matter to be included, the extent to which NASA obtains new documents falling within those subject-matter limits, and the coverage of existing abstract journals.

Space science is a term that has been frequently used, but which has not yet been rigorously defined. It may not be susceptible of rigorous definition. As it has been used, it encompasses almost completely such fields as astrophysics, astronomy, and celestial mechanics. However, it

also draws heavily on such supporting disciplines as mathematics, chemistry, biology, physics, and medicine. In the selection of material that will be included in the abstract journal, the requirements and guidance of NASA's technical and scientific staff will be the principal determinants. It is apparent that the subject coverage of the journal will progressively change with chronological changes in NASA's programs.

The extent to which NASA is able to accumulate all documents relevant to its programs will depend in large measure on the cooperation of other organizations in supplying us with their material. It is our expectation that the journal will be broadly distributed and will be sufficiently authoritative in selection and in coverage that organizations and individual scientists engaged in aeronautical and space activities will be desirous of having their material identified and announced in the journal.

The degree to which existing abstract journals meet NASA needs in specific subject fields will be given continuing surveillance. It is not our intention to duplicate any existing adequate service by producing an all-inclusive journal, although there will inevitably be some overlapping; some redundancy is probably desirable. However, since promptness of announcement is so high on our list of objectives, we will not consider it redundancy if we announce an item that will be announced elsewhere at a substantially later date. Neither will we consider it redundancy if another announcement provides abstracting but does not provide adequate indexing for retrieval purposes.

Techniques and equipment are now in use by other organizations preparing abstract journals that provide for announcing each document, with suitable abstracting and indexing, within a few weeks of receipt of the document. Such a schedule is to be established for NASA's abstract journal, which will be issued at two-week intervals.

In order to provide the user with means for selective scanning, items will be grouped in the journal under broad subject headings. Each issue will include four indexes to the documents in that issue, based on subject(s), author, corporate source, and report number. Indexing will be complete within each issue, and the indexes will be cumulated quarterly and annually. Retrospective searches can then be made by consulting the cumulated indexes that cover the period to be searched. Each cumulated index is to be distributed a month after the close of the period covered.

The subject headings under which the documents will be grouped and indexed are yet to be fully developed. The indexing is to be quite specific, and each document is to be indexed in considerable depth. Preliminary work on this development is now in progress by the Library of Congress, under a transfer of funds from NASA. A portion of their task is to determine the degree

to which NASA's indexing headings can be made compatible with systems of headings that are already in use by others, especially U. S. Government organizations.

No schedule has yet been set for the initial appearance of the abstract journal, and many preliminary steps have yet to be taken. The present NASA staff available for the work is insufficient for the whole task, and much of the work will be accomplished under contract. A contract is yet to be negotiated, but the administrative work leading to such a contract is now underway.

Until a contract has been let and the contractor has begun to operate effectively, the present technical-information staff of NASA will continue to carry out its current functions. In order to establish exchange agreements that will provide the material which will comprise the document collection and be announced in the abstract journal, the staff is continuing an intensive program to have NASA receive automatically all new aero-space documents.

Access to the Document Collection

NASA at present plans to supply other organizations only with documents for which NASA has responsibility for primary distribution. Each listing in the abstract journal will, however, include descriptive cataloging information sufficient to enable a reader to identify the source from which a needed non-NASA document can be obtained. In addition, the library of the NASA Headquarters, in Washington, is open to representatives of all organizations engaged in aeronautics and space activities. In the library these visitors have access to all documents that will be listed in the abstract journal.

Specialized Bibliographies

The mechanical equipment that will be used in preparing entries for the abstract journal may also be used to make retrospective searches. This will permit a rapid collation of the items that have been indexed for the journal under a given heading or group of headings. Such a collation will not comprise a specialized bibliography in a given subject area, but will provide a rapid display of material that can be subjectively culled to provide such a bibliography.

CONCLUDING REMARKS

In concluding, permit me to reiterate the dependence of NASA's proposed expansion in its documentation program on the cooperation of other space-oriented organizations in supplying NASA with their documentary products.

NASA proposes to provide the free world with means of keeping abreast of scientific developments in aeronautics and space activities that will be prompt, complete, and accurate. NASA can fashion a key to the bibliographic resources of these activities, but the material from which the key will be fabricated must be supplied by your organizations and the others that we will serve.

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DATE: 15 August 1960
SUPERCEDES CHART DATED APRIL 4, 1960